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CLAIMS

1. A mixing machine comprising a mixing chamber in which there are disposed at least two rotors arranged for rotation in opposite directions about respective rotational axes, at least one of the rotors having an axially extending projection and being rotatable so as to present a leading face of the projection to the material being mixed, wherein the leading face has a discontinuity in its profile along the axial direction of the rotor so as to define first and second portions, a majority of the leading face of the first portion being concave and a majority of the leading face of the second portion being convex.
2. A mixing machine according to claim 1, wherein each projection has a tip that defines a surface facing a substantially complementary wall of the mixing chamber, there being a clearance between the surface and the wall.
3. A mixing machine according to claim 2, wherein both rotors have such a projection and the loci defined by the periphery of the rotors during rotation intersect one another.
4. A mixing machine according to claim 2, wherein the surface of the tip of the first portion increases in circumferential length in the axial direction of the rotor.
5. A mixing machine according to claim 4, wherein the ratio of the circumferential lengths at each end of the first portion is in the range 1.1 to 10.
6. A mixing machine according to claim 4, where ratio of the circumferential lengths at each end of the first portion is in the range 1.5 to 3.
7. A mixing machine according to claim 2, wherein the ratio of the axial length of the first portion to the total length of the rotor is in the range 0.1 to 0.9.

8. A mixing machine according to claim 2, wherein the ratio of the axial length of the first portion to the total length of the rotor is in the range 0.6 to 0.8.
9. A mixing machine according to claim 2, wherein the circumferential length of the tip of second portion of the projection is consistent in the axial direction of the rotor and is between 3% and 50% of the maximum circumferential length of the tip of the first portion.
10. A mixing machine according to claim 2, wherein the circumferential length of the tip of second portion of the projection is consistent in the axial direction of the rotor and is between 3% and 15% of the maximum circumferential length of the tip of the first portion.
11. A mixing machine according to claim 1, wherein the height of the second portion of the projection above the rotor is lower than or equal to the height of the first portion of the projection.
12. A mixing machine according to claim 11, wherein the height of the second portion is between 25% and 100% of the height of the first portion.
13. A mixing machine according to claim 11, wherein the height of the second portion is between 70% to 90% of the height of the first portion.
14. A mixing machine according to claim 2, wherein the clearance defined between the tip surface and the mixing chamber wall decreases in the direction of rotation of the rotor.
15. A mixing machine comprising a mixing chamber in which there are disposed at least two rotors arranged for rotation in opposite directions about respective rotational axes, at least one of the rotors having a projection that extends axially along the rotor and has a tip defining a circumferential surface whose circumferential length increases along the axial direction.

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16. A mixing machine comprising a mixing chamber in which there are disposed at least two rotors arranged for rotation in opposite directions about respective rotational axes, at least one of the rotors having a projection that extends axially along the rotor and has a tip defining a circumferential surface that forms at least 5% of the circumference of the rotor and is tapered so that the clearance defined between the tip surface and the mixing chamber wall decreases in the direction of rotation of the rotor.